

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING

## PCT

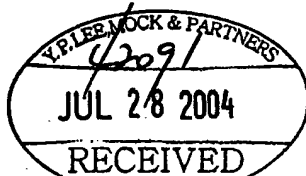
### NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

( PCT Rule 71.1 )

To:

LEE, Young-Pil

The Cheonghwa Building, 1571-18 Seocho-dong, Seocho-gu  
Seoul 137-874, Republic of KOREA



Date of mailing  
(day/month/year) 07 JULY 2004 (07.07.2004)

Applicant's or agent's file reference  
SH-18948-PCT

#### IMPORTANT NOTIFICATION

International application No.

**PCT/KR2003/000625**

International filing date (day/month/year)

**28 MARCH 2003 (28.03.2003)**

Priority date (day/months/year)

28 MARCH 2002 (28.03.2002)

Applicant

**SAMSUNG ELECTRONICS CO., LTD. et al**

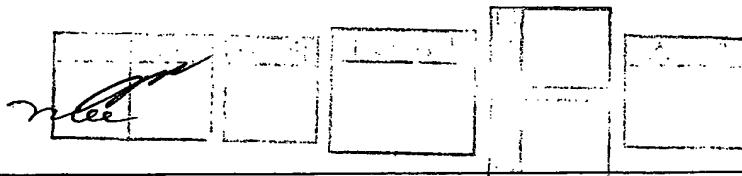
1. The applicant is hereby notified that International Preliminary Examining Authority transmits here with the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details in the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.



Name and mailing address of the IPEA/KR



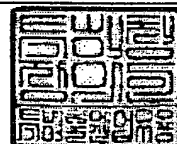
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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 17 SEP 2004

WIPO

PCT

Applicant's or agent's file reference SH-18950-PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/KR2003/000968</b>	International filing date (day/month/year) <b>16 MAY 2003 (16.05.2003)</b>	Priority date (day/month/year) 16 MAY 2002 (16.05.2002)
International Patent Classification (IPC) or national classification and IPC  <b>IPC7 G11B 7/24</b>		
Applicant  <b>SAMSUNG ELECTRONICS CO., LTD. et al</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  20 NOVEMBER 2003 (20.11.2003)	Date of completion of this report  02 SEPTEMBER 2004 (02.09.2004)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  JANG, Hyun Sook Telephone No. 82-42-481-5404 

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/000968

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
pages 1 ~ 11, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement) under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages 11 ~ 13, filed with the letter of 20.07.2004
- ☒ the drawings:  
pages 1/6 ~ 6/6, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheet \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR2003/000968

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1 ~ 20	YES
	Claims		NO
Inventive step (IS)	Claims	3 ~ 20	YES
	Claims	1, 2	NO
Industrial applicability (IA)	Claims	1 ~ 20	YES
	Claims		NO

### 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1 = JP P2002-190112 A

D2 = US 4855992 A

The present invention relates to a recording medium having a high melting point recording layer between dielectric layers.

D1 relates to an optical recording medium wherein various elements are added to a recording layer which is formed between dielectric layers.

D2 discloses a reversible optical recording medium with an optothermally deformable recording layer.

Claims 1 of the present invention relates to a recording medium comprising a high melting point recording layer between first and second dielectric layers, wherein the high melting point recording layer is formed of W, Ta, or mixture. These components are similar to those of the recording medium presented in D1 and D2; for a detailed explanation, see Page 3, Line 43 to Page 4, Line 8 of D2.

Claim 2 of the present invention discloses the recording medium of Claim 1, further comprising a reflective layer underneath the second dielectric layer. This structure is the same as that of D1.

Claims 3-8 of the present invention relate to a method of manufacturing a recording medium having a high melting point. However, a laser radiation for the inducing reaction and diffusion in the high melting point recording layer is a new component.

An apparatus and method comprising generating plasmon at a high melting point of Claims 9-20 of the present invention is not known.

(continued on Supplemental Box)

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/000968

## Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

### Continuation of:

From the above comparisons, Claims 1-20 of the present invention are considered to be novel according to PCT Article 33(2). Claims 1 and 2 of the present invention are easy for a person skilled in the art to arrive at by D1 and D2; therefore, the invention is not considered to involve an inventive step according to PCT Article 33(3). Claims 1-20 of the present invention are considered to be industrially applicable according to PCT Article 33(4).

What is claimed is:

1. A recording medium comprising a high melting point recording layer between first and second dielectric layers, wherein the high melting point recording layer is formed of tungsten, tantalum, a tungsten compound, a tantalum compound, or a mixture thereof.

2. The recording medium of claim 1, further comprising a reflective layer underneath the second dielectric layer.

3. A method of recording information on a recording medium having a high melting point recording layer between first and second dielectric layers, the method comprising irradiating a laser beam onto the recording medium to induce reaction and diffusion in the high melting point recording layer and the first and second dielectric layers.

4. The method of claim 3, wherein the high melting point recording layer is formed of tungsten.

5. The method of claim 3, wherein the high melting point recording layer is formed of tantalum.

6. The method of claim 3, wherein the high melting point recording layer is formed of a tungsten compound.

7. The method of claim 3, wherein the high melting point recording layer is formed of a tantalum compound.

8. The method of any one of claims 3 through 7, wherein the recording medium further comprises a reflective layer underneath the second dielectric layer.

9. An apparatus of reproducing information from a recording

medium having a high melting point recording layer between first and second dielectric layers, the apparatus generating plasmon using crystalline particles of the high melting point recording layer and the first and second dielectric layers as a scattering source to reproduce  
5 information recorded in the recording layer using a super-resolution near-field structure regardless of the diffraction limit.

10 10. The apparatus of claim 9, wherein the high melting point recording layer is formed of tungsten.

11. The apparatus of claim 10, wherein the high melting point recording layer is formed of tantalum.

15 12. The apparatus of claim 10, wherein the high melting point recording layer is formed of a tungsten compound.

13. The apparatus of claim 10, wherein the high melting point recording layer is formed of a tantalum compound.

20 14. The apparatus of any one of claims 9 through 13, wherein the recording medium further comprises a reflective layer underneath the second dielectric layer.

25 15. A method of reproducing information from a recording medium having a high melting point recording layer between first and second dielectric layers, the method comprising generating plasmon using crystalline particles of the high melting point recording layer and the first and second dielectric layers as a scattering source to reproduce information recorded in the recording layer using a super-resolution  
30 near-field structure regardless of the diffraction limit.

16. The method of claim 15, wherein the high melting point

recording layer is formed of tungsten.

17. The method of claim 15, wherein the high melting point recording layer is formed of tantalum.

5

18. The method of claim 15, wherein the high melting point recording layer is formed of a tungsten compound.

19. The method of claim 15, wherein the high melting point  
10 recording layer is formed of a tantalum compound.

20. The method of any one of claims 15 through 19, wherein the recording medium further comprises a reflective layer underneath the second dielectric layer.